

REMARKS

Favorable reconsideration of this application, in light of the following discussion and in view of the present amendment, is respectfully requested.

Claims 1, 8 and 9 are amended. Claims 3, 5 and 17 are cancelled. Claims 1, 2, 4, 6-16, 18 and 19 are pending.

I. Information Disclosure Statement

An English language translation of Japanese Patent No. 4-015517, submitted in an Information Disclosure Statement filed November 23, 2005, is enclosed herewith in the Supplemental Information Disclosure Statement.

Attached?
or filed

Rejection under 35 U.S.C. § 103

In the Office Action, at page 2, claims 1-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,900,727 to Griffen et al. in view of Japanese Patent No. 4-015517. This rejection is respectfully traversed because the combination of the teachings of Griffin and JP '517 does not suggest that:

said plurality of signal generating members are respectively formed in such a manner that numbers of signal-cycles and signal-intervals in signals generated during a unit rotation of respective signal generating members are different from each other, while products of said numbers of signal-cycles multiplied by said signal-intervals in said signals are generally identical to each other,

wherein said plurality of signal generating members have outer diameters generally identical to each other and inner diameters generally identical to each other,

as recited in amended independent claim 1.

The combination of the teachings of Griffin and JP '517 further does not suggest that:

said first signal generating member is formed in such a manner that a number of signal-cycles and a signal-interval in said first signal generated during a unit rotation of said first signal generating member is different from a number of signal-cycles and a signal-interval in said second signal generated during a unit rotation of said second signal generating member, while a product of said number of signal-cycles multiplied by said signal-interval in said first signal is generally identical to a product of said number of signal-cycles multiplied by said signal-interval in said second signal,

wherein said first and second signal generating members have

outer diameters generally identical to each other and ~~have~~ inner diameters generally identical to each other,

as recited in amended independent claim 8.

In addition, the combination of the teachings of Griffin and JP '517 does not suggest that:

at least two signal generating members, each signal generating member exchangeably attachable to the rotary body, each signal generating member having approximately the same outer diameter as the other signal generating members and each including a signal generating element having a signal-generation pitch different from the other signal generating members,

wherein the signal generating members each have inner diameters generally identical to each other,

as recited in amended independent claim 9.

As a non-limiting example, the present invention of claim 1, for example, is directed to a rotary encoder including signal generating members and a signal sensing unit. The signal generating members are formed such that the numbers of signal-cycles and signal-intervals in signals generated during a unit rotation of respective signal generating members are different from each other, while products of the numbers of signal-cycles multiplied by the signal-intervals in the signals are generally identical to each other. The signal generating members have inner and outer diameters that are generally identical to each other.

As conceded by the Examiner, Griffen does not discuss or suggest that numbers of signal-cycles and signal-intervals in signals generated during a unit rotation of respective signal generating members are different from each other, while products of said numbers of signal-cycles multiplied by said signal-intervals in said signals are generally identical to each other. Further, Griffen does not discuss or suggest that the inner and outer diameters of each of the signal generating members are generally identical to each other. The Examiner alleges that JP '517 makes up for the deficiency in Griffen. The Applicants respectfully disagree.

JP '517 shows a magnetic encoder that has two magnetic drums, each of which is provided on the outer circumferential surface thereof with a plurality of poles. In Fig. 2, JP '517 discloses as prior art two magnetic drums 11 and 12 that have the same outer diameter and mutually different numbers of poles. However, JP '517 does not discuss or suggest that the magnetic drums 11 and 12 have the same inner diameter. In Fig. 1, as discussed in the abstract, the outside diameter of the drums 1 and 2 is different, with drum 2 being larger than drum 1.

Further, JP '517 does not discuss how the magnetic drums 11, 12 are connected to the shaft 6. In the present invention of claim 1, for example, the inner diameters of the signal generating members 14, 22 and 26 all have the same inner diameter so that the signal generating members are able to be attached and detached from the same rotary body 18. Thus, the signal generating members 14, 22 and 26 are easily coaxially attached the desired signal generating member to the rotary body, without changing the structure or size of an attachment portion on the rotary body for receiving the signal generating members. The signal generating members 14, 22 and 26 each have approximately the same outer diameter so that numbers of signal-cycles and signal-intervals in signals generated during a unit rotation of respective signal generating members are different from each other, while products of the numbers of signal-cycles multiplied by the signal-intervals in the signals are generally identical to each other.

Therefore, the combination of the teachings of Griffin and JP '517 does not suggest that "said plurality of signal generating members are respectively formed in such a manner that numbers of signal-cycles and signal-intervals in signals generated during a unit rotation of respective signal generating members are different from each other, while products of said numbers of signal-cycles multiplied by said signal-intervals in said signals are generally identical to each other, wherein said plurality of signal generating members have outer diameters generally identical to each other and inner diameters generally identical to each other," as recited in amended independent claim 1. The combination of the teachings of Griffin and JP '517 further does not suggest that "said first signal generating member is formed in such a manner that a number of signal-cycles and a signal-interval in said first signal generated during a unit rotation of said first signal generating member is different from a number of signal-cycles and a signal-interval in said second signal generated during a unit rotation of said second signal generating member, while a product of said number of signal-cycles multiplied by said signal-interval in said first signal is generally identical to a product of said number of signal-cycles multiplied by said signal-interval in said second signal, wherein said first and second signal generating members have outer diameters generally identical to each other and have inner diameters generally identical to each other," as recited in amended independent claim 8. In addition, the combination of the teachings of Griffin and JP '517 does not suggest that "at least two signal generating members, each signal generating member exchangeably attachable to the rotary body, each signal generating member having approximately the same outer diameter as the other signal generating members and each including a signal generating element having a signal-generation pitch different from the other signal generating members, wherein the signal generating members each have inner diameters generally identical to each other," as recited in

amended independent claim 9. Thus, claims 1, 8 and 9 patentably distinguish over the references relied upon. Accordingly, withdrawal of the § 103(a) rejection is respectfully requested.

Claims 2, 4, 6, 7, 10-16, 18 and 19 depend either directly or indirectly from independent claims 1, 8 and 9 and include all the features of their respective independent claims, plus additional features that are not discussed or suggested by the references relied upon. For example, claim 7 recites that "each of said plurality of signal generating members includes a signal generating element comprising at least one magnetized pattern." Therefore, claims 2, 4, 6, 7, 10-16, 18 and 19 patentably distinguish over the references relied upon for at least the reasons noted above. Accordingly, withdrawal of the § 103(a) rejection is respectfully requested.

Conclusion

In accordance with the foregoing, claims 1, 8 and 9 have been amended. Claim 3, 5, 17 have been cancelled. Claims 1, 2, 4, 6-16, 18 and 19 are pending and under consideration.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

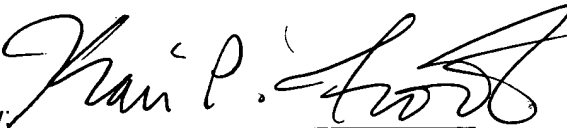
Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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Date: 3/21/07

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